

First record of the Radial Lionfish, *Pterois radiata* Cuvier, 1829 (Scorpaeniformes, Scorpaenidae), for Kosrae, Micronesia

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Abstract

The Radial Lionfish, *Pterois radiata* Cuvier, 1829, is widely distributed across the tropical Indian Ocean and western Pacific Ocean and has been previously documented from most of the major island groups of Micronesia, but not from Kosrae. On 21 June 2014 an adult *P. radiata* was photographed in shallow water along the eastern edge of Blue Hole near Lelu village, Kosrae, Micronesia, providing the first documented record for Kosrae.

Keywords

Geographic distribution, marine fish, Pacific Ocean, range extension.

Academic editor: Hudson Tercio Pinheiro | Received 28 January 2020 | Accepted 17 April 2020 | Published 8 September 2020

Citation: Hayes FE (2020) First record of the Radial Lionfish, *Pterois radiata* Cuvier, 1829 (Scorpaeniformes, Scorpaenidae), for Kosrae, Micronesia. Check List 16 (5): 1125–1128. <https://doi.org/10.15560/16.5.1125>

Introduction

Radial Lionfish, *Pterois radiata* Cuvier, 1829, is widely distributed across the Indo-Pacific, from the east coast of Africa to French Polynesia (Matsunuma and Motomura 2016). It has been previously recorded from several island groups in Micronesia, including Palau, Yap, Guam, Ifalik Atoll, Kapingamarangi, Pohnpei, and Marshall Islands (e.g., Kami et al. 1968; Myers 1991; Donaldson 1996; Donaldson et al. 2011; Matsunuma and Motomura 2016). At least 358 species of inshore and epipelagic fishes have been previously reported from the state of Kosrae (Myers 1991), which is the easternmost high island in Micronesia (Fig. 1). Previous surveys of Kosrae's coral reef fish fauna documented two species of the genus *Pterois*: Broadbarred Firefish, *Pterois antennata* (Bloch, 1787), and Red Lionfish, *Pterois volitans* (Linnaeus, 1758) (Eldredge et al. 1979; Donaldson et al.

2011). This note reports the first confirmed record of *P. radiata* for Kosrae.

Methods

The author visited Kosrae during 18–28 June 2013 and 17–27 June 2014. During these periods the author spent 14 h snorkeling, including 11.5 h during the day and 2.5 h during the night, at Blue Hole (05°20.42'N, 163°01.37'E), a large open area of approximately 4 ha comprising a sandy bottom at least 15 m deep and surrounded by corals, on the reef flat about 700 m north of Lelu village on the northeast coast of Kosrae, Micronesia (US Army Corps of Engineers 1989; Fig. 1). The author photographed various species of invertebrates and fishes, and subsequently identified the fishes by consulting Myers (1991). The English and scientific names of fishes in this

note follow Froese and Pauly (2019). Geographic coordinates and distances between islands were obtained from Google Earth (<https://www.google.com/earth>).

Results

Pterois radiata Cuvier, 1829

New record (Fig. 1). Micronesia • specimens not collected; Kosrae; Lelu; along the eastern edge of Blue

Hole; 05°20.51'N, 163°01.40'E; 2–3 m deep; 21 Jun. 2014; Floyd E. Hayes (photographer); one live adult photographed (Fig. 2) at night, swimming just above the substrate, which comprised dead fragments of coral, *Acropora* Oken, 1815.

Identification. Three species of *Pterois* Oken, 1817 occur in Micronesia (Myers 1991). Of these, only *P. antennata* and *P. volitans* had been previously recorded from Kosrae (Eldredge et al. 1979; Myers 1991; Donaldson et

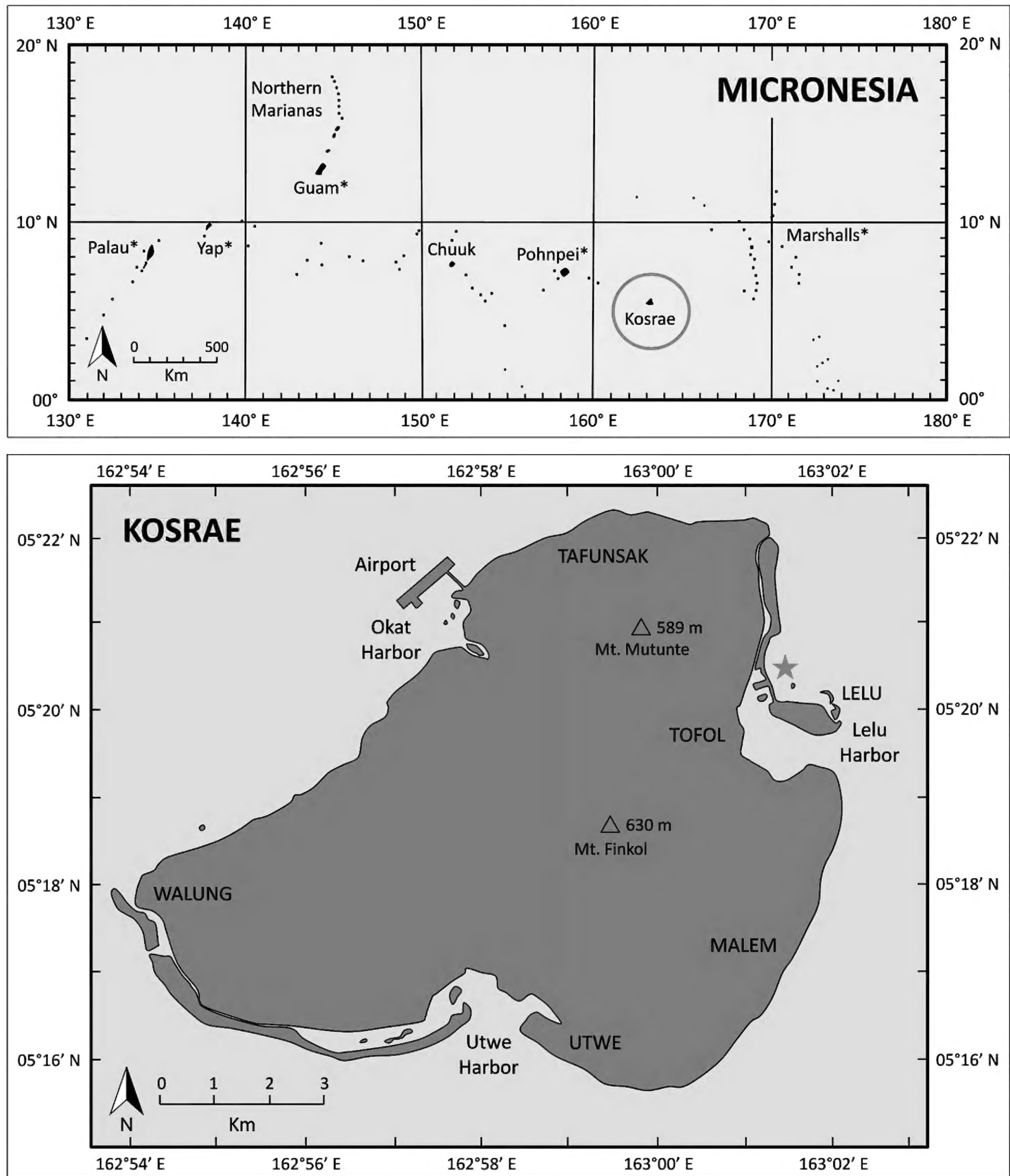


Figure 1. A map of Micronesia (above) with major island groups for which the Radial Lionfish *Pterois radiata* has been recorded (indicated with an asterisk; Myers 1991, Matsunuma and Motomura 2016) and the new record for Kosrae (circled), and a map of Kosrae (below) with a star indicating the locality of a Radial Lionfish *Pterois radiata* photographed at Blue Hole, Lelu, Kosrae, on 21 June 2014.

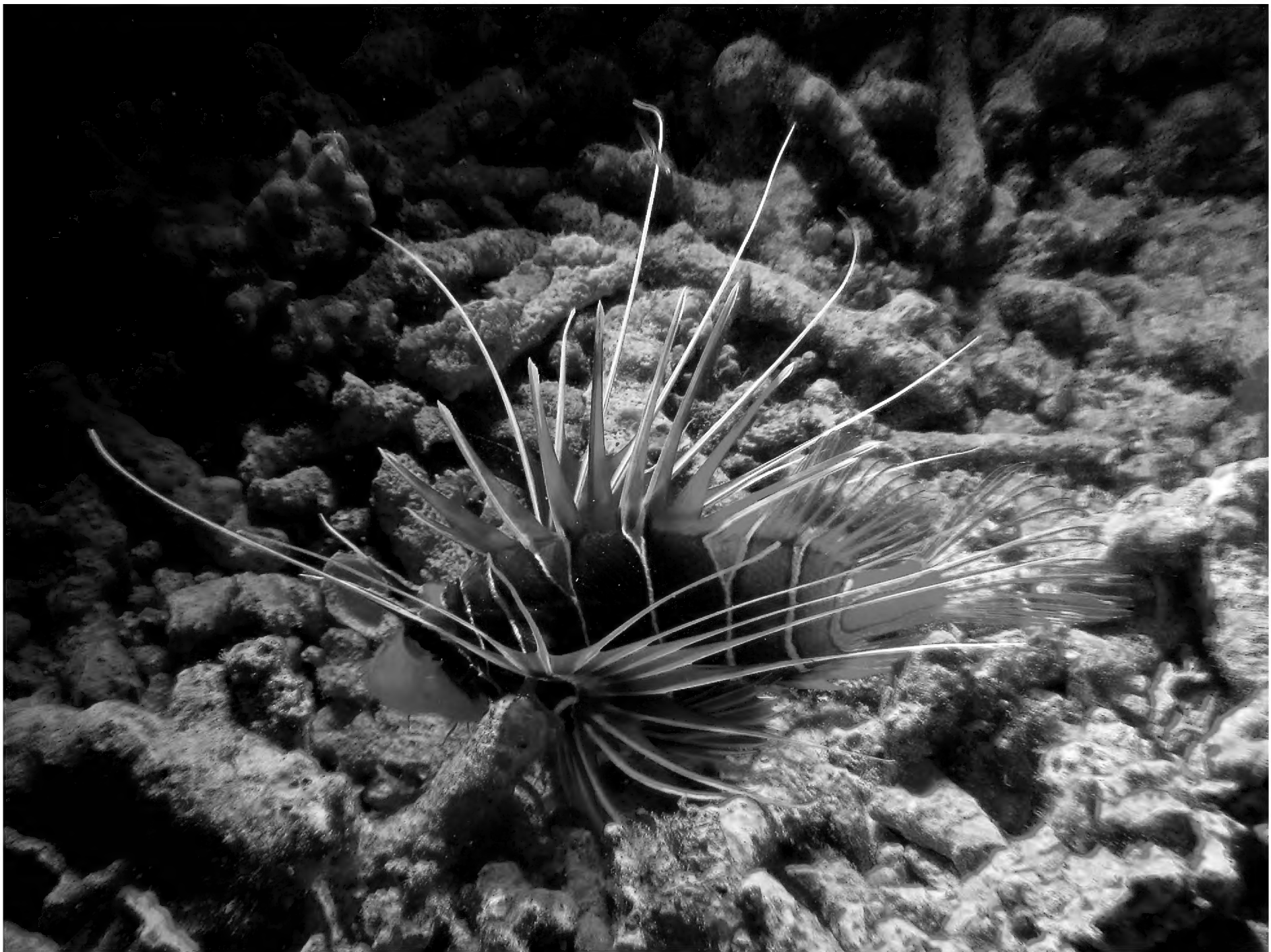


Figure 2. A Radial Lionfish *Pterois radiata* at Blue Hole, Lelu, Kosrae, on 21 June 2014. Photo by Floyd E. Hayes.

al. 2011). The *P. radiata* photographed by the author was identified by the wide dark bars on its body separated by a thin white line and the unbanded filamentous pectoral fin rays, which differ from the narrower dark bands separated by multiple thin white lines and banded filamentous pectoral fin rays in both *P. antennata* and *P. volitans* (Myers 1991; Allen et al. 2015).

Discussion

The author repeatedly encountered *Pterois* lionfishes during both day and night in shallow water along the eastern edge of Blue Hole, but only two individuals were photographed and identified: the adult *P. radiata* described above and, on 19 June 2013, an adult *P. antennata*. *Pterois* lionfishes are relatively secretive and easily overlooked, occurring at lower densities in the Pacific Ocean than in the Indian Ocean and, especially, the Caribbean Sea where it was recently introduced (Kulbicki et al. 2012). Furthermore, *P. radiata* is rarer than *P. antennata* and *P. volitans* in Micronesia and other western Pacific islands (Donaldson et al. 2011; Kulbicki et al. 2012; Cure et al. 2014), except on remote coral reefs of Palau (Donaldson 1996; Grubich et al. 2009). At Kosrae, a survey of Okat Harbor by Eldredge et al. (1979) reported *P. antennata* as rare (“not more than one individual sighted on any one dive”) and

P. volitans as occasional (“2–5 per transect or 2–10 per diver hr”) along the margins of the harbor; none were observed in other habitats, including reef flat holes. Fish surveys at 41 sites by the US Army Corps of Engineers (1989) revealed only one lionfish, a *P. volitans*, in Lelu Harbor; none was observed in Blue Hole, where 33 species of fishes were identified. Donaldson et al. (2011) searched for lionfishes along 125 transects of variable length, encountering only one *P. antennata* and six *P. volitans*.

Although all species of *Pterois* lionfishes can be observed during daylight, they are predominantly crepuscular or nocturnal in their foraging activity (Fishelson 1975; Donaldson et al. 2011; Cure et al. 2014) and are more likely to be overlooked during daylight surveys. Crepuscular or nocturnal surveys may be more appropriate for studying the relative abundance of lionfishes. Because *P. radiata* is the rarest lionfish species in Micronesia and easiest to overlook, it is unsurprising that gaps remain in its known distribution. The occurrence of *P. radiata* in Kosrae fills a gap between the closest documented localities of Pohnpei approximately 535 km to the west-northwest, Enewetok Atoll approximately 675 km to the north, Bikini Atoll approximately 725 km to the north-northeast, and Nauru approximately 775 km to the southeast (Matsunuma and Motomura 2016).

Acknowledgements

Fieldwork in Kosrae was funded by the Faculty Development Fund, a Herber Family Faculty Development Grant, and the Margaret Huse Biology Faculty Research Fund from Pacific Union College. The author thanks William Tara and Larry Cooper Neth for providing logistical assistance in Kosrae, and Brandon and Christine Painter for accompanying the author on the night of 21 June 2014. This research project was approved by the Faculty Research and Development Committee of Pacific Union College and it complied with the current laws of the Federated States of Micronesia.

References

- Allen G, Steen R, Humann P, DeLoach N (2015) Reef fish identification: tropical pacific, 2nd edition. New World Publications, Jacksonville, 475 pp.
- Cure K, McIlwain JL, Hixon MA (2014) Habitat plasticity in native Pacific Red Lionfish *Pterois volitans* facilitates successful invasion of the Atlantic. *Marine Ecology Progress Series* 506: 243–253. <https://doi.org/10.3354/meps10789>
- Donaldson TJ (1996) Fishes of the remote Southwest Palau Islands: a zoogeographic perspective. *Pacific Science* 50 (3): 285–308.
- Donaldson TJ, Benavente D, Diaz D (2011) Why are lionfishes (*Pterois*, Scorpaenidae) so rare in their native ranges? *Proceedings of the Gulf and Caribbean Fisheries Institute* 63: 352–359.
- Eldredge LG, Best BR, Chernin MI, Kropp RK, Myers RF, Smalley TL (1979) Marine environmental survey of Okat, Kosrae. University of Guam Marine Laboratory Report 63: 1–101.
- Fishelson L (1975) Ethology and reproduction of pteroid fishes found in the Gulf of Aqaba (Red Sea), especially *Dendrochirus brachypterus* (Cuvier), (Pteroidae, Teleostei). *Pubblicazioni della Stazione Zoologica di Napoli* 39 suppl.: 635–656.
- Froese R, Pauly D (2019). FishBase. World Wide Web electronic publication, Version (08/2019). <https://www.fishbase.in>. Accessed on: 2019-12-05.
- Grubich JR, Westneat MW, McCord CL (2009) Diversity of lionfishes (Pisces: Scorpaenidae) among remote coral reefs of the Palau Archipelago. *Coral Reefs* 28 (3): 807. <https://doi.org/10.1007/s00338-009-0510-z>
- Kami HT, Ikehara II, DeLeon FP (1968) Check-list of Guam fishes. *Micronesia* 4 (1): 95–131.
- Kulbicki M, Beets J, Chabanet P, Cure K, Darling E, Floeter SR, Galzin R, Green A, Harmelin-Vivien M, Hixon M, Letourneur Y, Lison de Loma T, McClanahan T, McIlwain J, MouTham G, Myers R, O’Leary JK, Planes S, Vigliola L, Wantiez L (2012) Distributions of Indo-Pacific lionfishes *Pterois* spp. in their native ranges: implications for the Atlantic invasion. *Marine Ecology Progress Series* 446: 189–205. <https://doi.org/10.3354/meps09442>
- Matsunuma M, Motomura H (2016) Redescriptions of *Pterois radiata* and *Pterois cincta* (Scorpaenidae: Pteroinae) with notes on geographic morphological variations in *P. radiata*. *Ichthyological Research* 63 (1): 145–172. <https://doi.org/10.1007/s10228-015-0483-6>
- Myers RF (1991) Micronesia reef fishes, 2nd edition. Coral Graphics, Guam, 298 pp.
- US Army Corps of Engineers (1989) Kosrae coastal resource inventory. Environmental Resources Section, US Army Engineer District, Honolulu, Hawaii, 187 pp.